Types of Neuroglial Cells in the PNS

1) Schwann Cells
   - Produce myelin found on peripheral myelinated neurons
   - Speed up neurotransmission

) Satellite Cells
- Support clusters of neuron cell bodies (ganglia)

Types of Neuroglial Cells in the CNS

1) Microglia
- CNS
- Phagocytic cell

2) Astrocytes
- CNS
- Scar tissue
- Mop up excess ions, etc.
- Induce synapse formation
- Connect neurons to blood vessels

3) Oligodendrocytes
- CNS
- Myelinating cell

4) Ependyma or ependymal
- CNS
- Ciliated
- Line central canal of spinal cord
- Line ventricles of brain

Types of Neuroglial Cells

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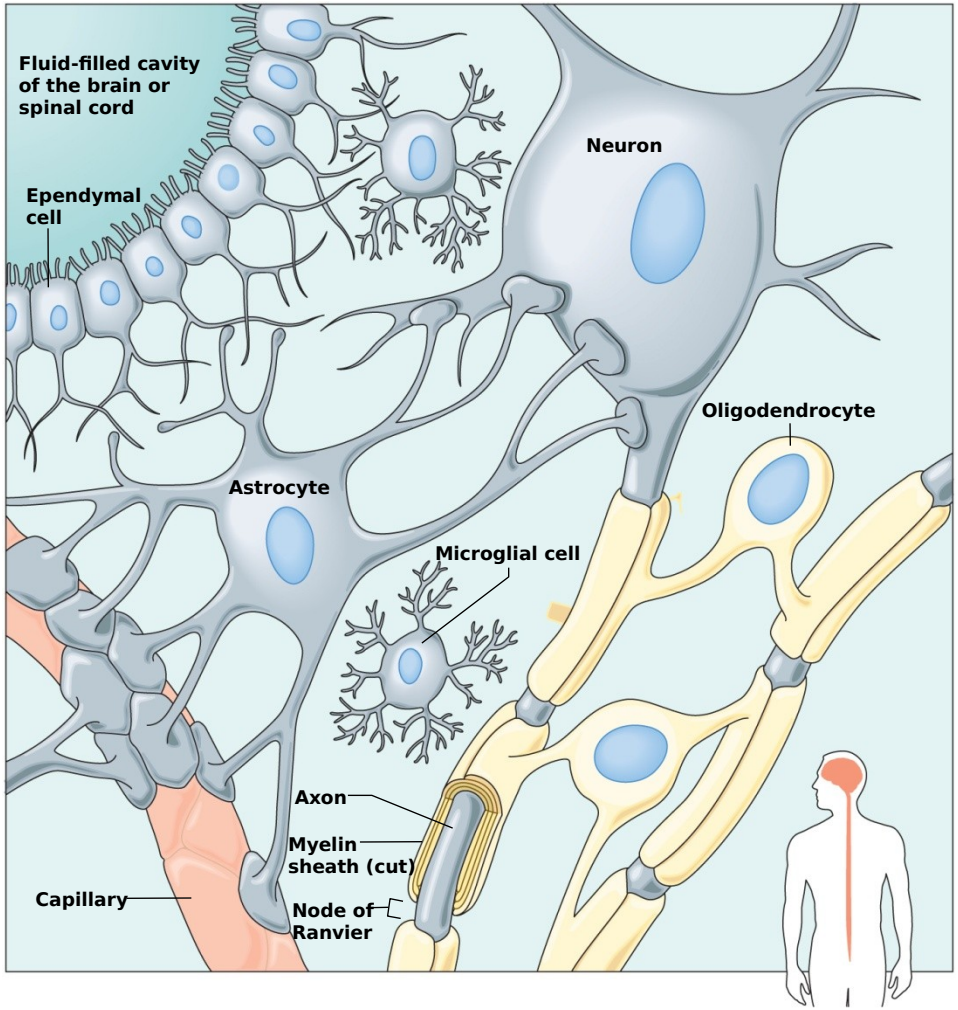

Regeneration of A Nerve Axon

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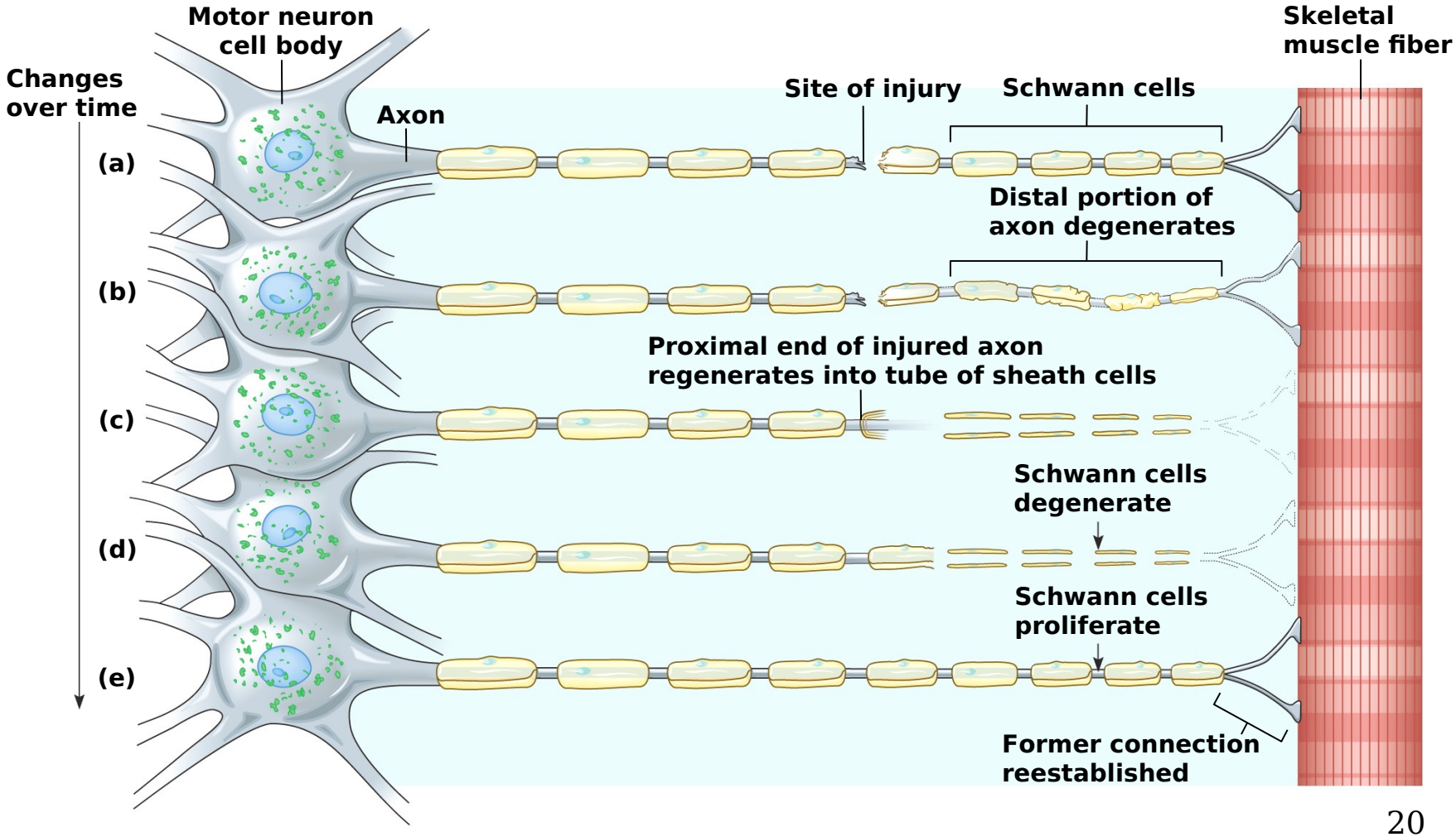

10.5: The Synapse

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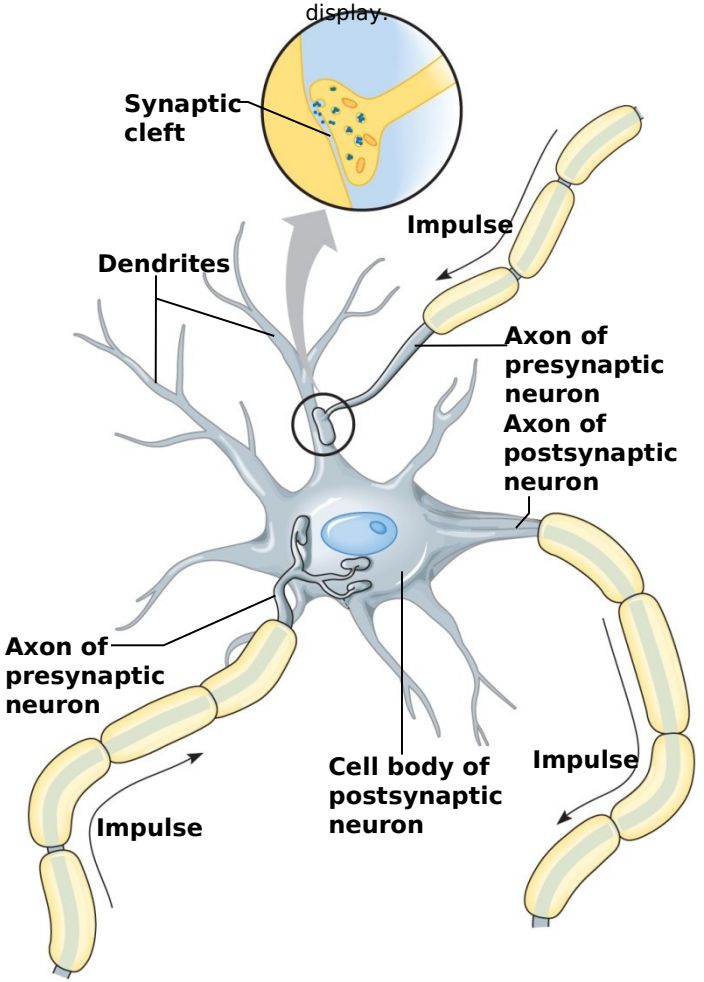
- Nerve impulses pass from neuron to neuron at synapses, moving from a pre-synaptic neuron to a post-synaptic neuron.



Synaptic Transmission

- Neurotransmitters are released when impulse reaches synaptic knob

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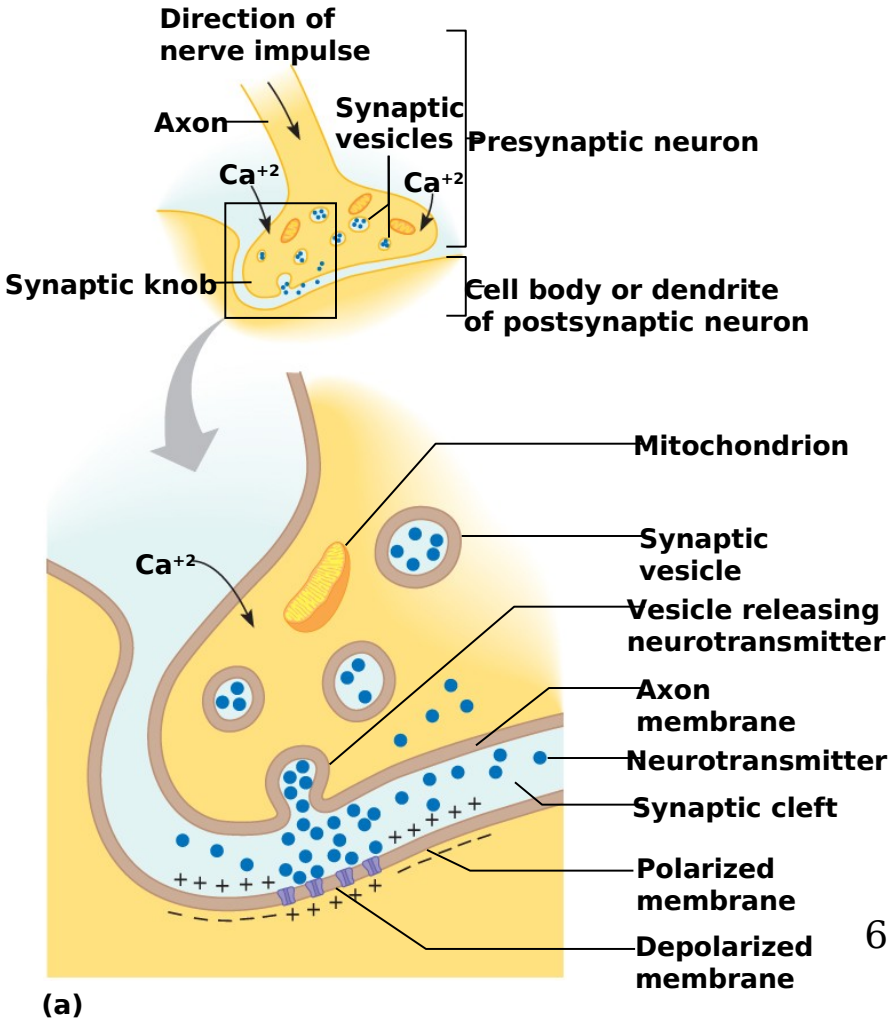
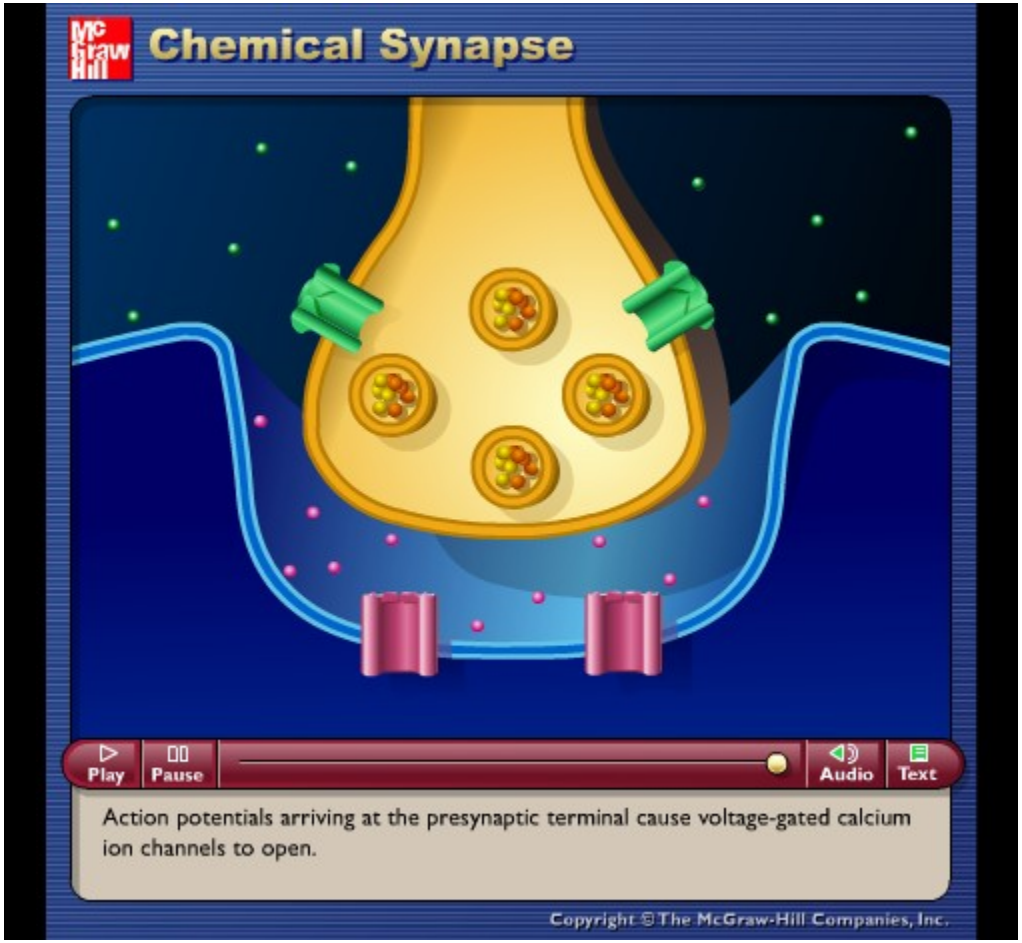


Animation: Chemical Synapse



10.6: Cell Membrane Potential

- A cell membrane is usually electrically charged, or polarized, so that the inside of the membrane is negatively charged with respect to the outside of the membrane (which is then positively charged).

- This is as a result of unequal distribution of ions on the inside and the outside of the membrane.

Distribution of Ions

- Potassium (K^+) ions are the major intracellular positive ions (cations).
- Sodium (Na^+) ions are the major extracellular positive ions (cations).
- This distribution is largely created by the Sodium/Potassium Pump (Na^+/K^+ pump).
- This pump actively transports sodium ions out of the cell and potassium ions into the cell.

Resting Potential

- Resting Membrane Potential (RMP):
  - 70 mV difference from inside to outside of cell
  - It is a polarized membrane
  - Inside of cell is negative relative to the outside of the cell
  - RMP = -70 mV
  - Due to distribution of ions inside vs.

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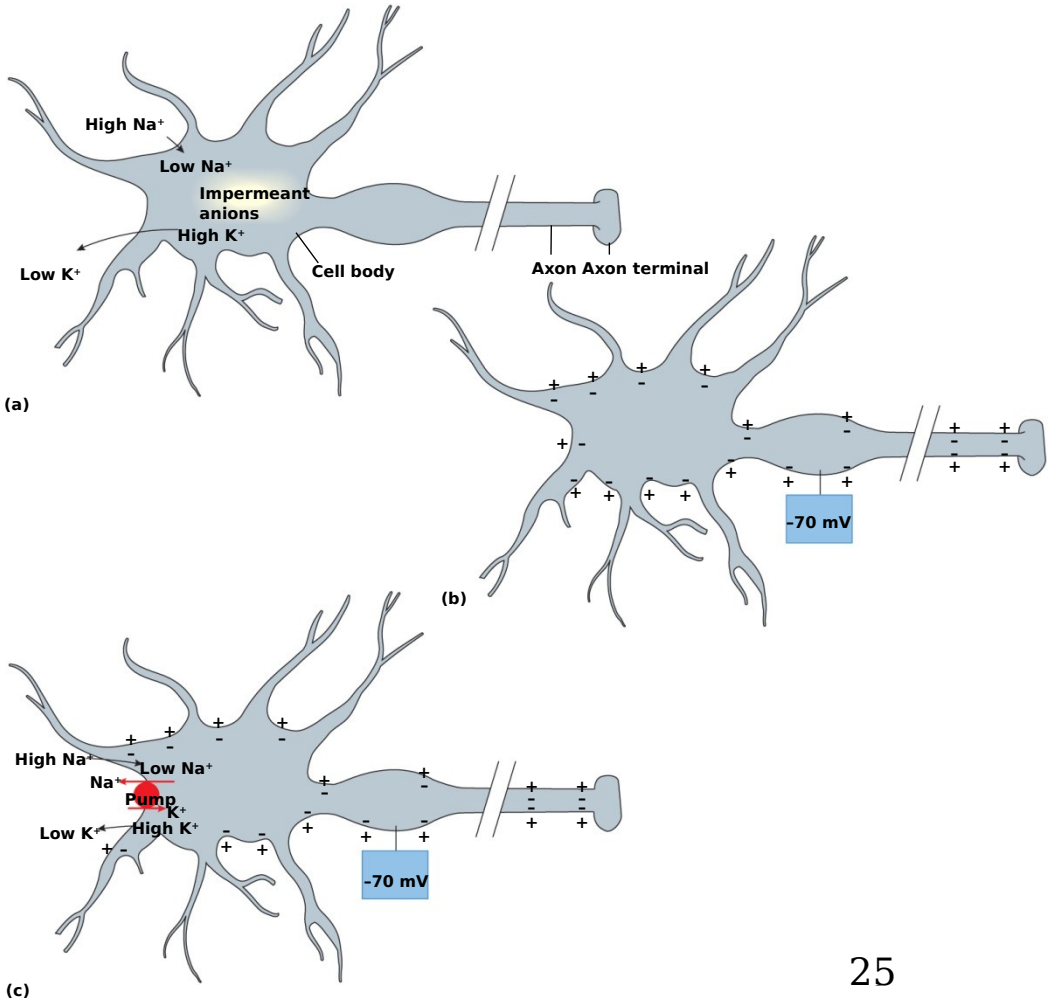

Local Potential Changes

- Caused by various stimuli:
  - Temperature changes
  - Light
  - Pressure

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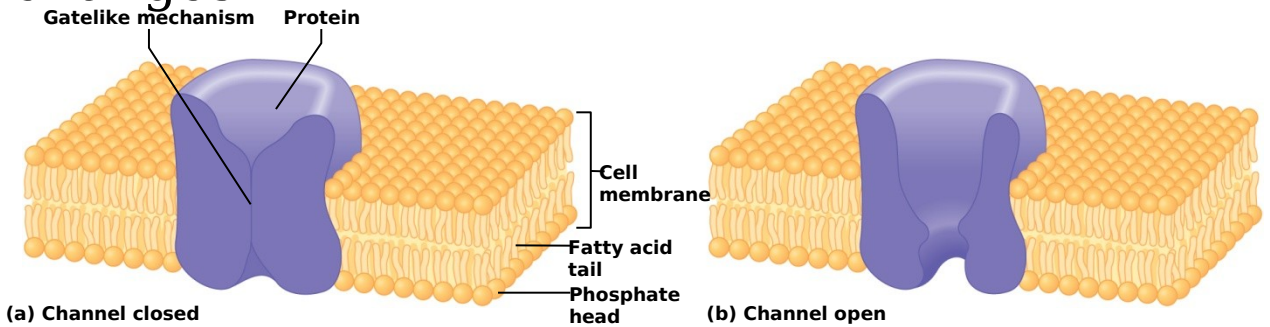

- Environmental changes affect the membrane potential by opening a gated ion channel

- Channels are 1) chemically gated, 2) voltage gated, or 3) mechanically gated

Local Potential Changes

- If membrane potential becomes more negative, it has *hyperpolarized*

- If membrane potential becomes less negative, it has *depolarized*

- Graded (or proportional) to intensity of stimulation reaching threshold potential

- Reaching threshold potential results in a nerve impulse, starting an action potential